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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,259	04/10/2006	Kazuo Chikaraishi	Q94302	8807

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EXAMINER	
YEAGLEY, DANIEL S	

ART UNIT	PAPER NUMBER
3611	

MAIL DATE	DELIVERY MODE
12/10/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/575,259	CHIKARAISHI, KAZUO	
	Examiner	Art Unit	
	Daniel Yeagley	3611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 April 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/10/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al 5,732,790; in view of Fecht et al EP386439.

Endo shows an electric power steering apparatus for assisting steering of a steering shaft by rotation of an electric motor 117 through a reducer 115 based on a steering torque detected by a torque sensor 105, wherein a rotary potentiometer is disposed in the reducer (figure 10 - 20), and a portion of a swing arm 520b of a potentiometer 520 is engaged with a swirl groove 411g in the reducer comprising a worm wheel gear means, wherein the swirl groove is formed to a to-be-

detected member separated from the worm wheel gear, such that the swing arm is swingingly rotated according to a rotation of the coupled worm wheel with the swirl groove of the reducer mechanism to detect a rotation angle of the steering shaft, but failed to show the swirl groove for engaging with the potentiometer being formed on a side of the worm wheel, where the swirl groove is formed on a side face of a flange portion of the worm wheel gear means to attached swirl groove to the side of the worm wheel.

Fecht shows a potentiometer sensor means for detecting a rotation angle of a steering shaft that shows the art of utilizing a swirl groove 19 on a to-be-detected member that is attached to and formed on a side face of a wheel gear 13 in a steering system which engages with a potentiometer for determining a rotary movement of a steering shaft using a slider and swirl groove arrangement disposed on a side face a wheel gear (figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the reducer and potentiometer arrangement of Endo and attached the swirl grooved to-be detected member for the pin of the potentiometer onto an alternative element of the reducer, such as an end face of the worm wheel gear of Endo reducer; simple as an alternate location for attaching the groove for the pin guided potentiometer to an alternative to-be detected member, such as a side face of a wheel gear surface, like that taught by Fecht potentiometer arrangement in order to provide a more compact arrangement of the potentiometer and gear wheel, as suggested by Fecht (abstract) and would equally determines the rotary movement of a steering shaft with a more precise accurate measurement of a rotary signal; as further taught by Fecht.

4. Claims 2 – 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al '790; as modified by Fecht '439, in further view of Tachiiri et al 2003/0070885.

Endo discloses an electric power steering apparatus for assisting steering of a steering shaft having a rotary potentiometer disposed in a reducer, wherein the swirl groove for the potentiometer is formed on a to-be-detected member separated from the worm wheel gear and, as modified by grooved end face of the gear wheel of Fecht potentiometer that is molded integrally and formed on an outer peripheral surface of a wheel gear for detecting a rotation angle of a steering shaft, and wherein Endo suggests using a resin material with the potentiometer to reduce heat conductively and provide a more precision detection device, but failed to disclose the composition of the worm wheel gear being a metal core with a resin portion formed on the outer peripheral surface of the wheel.

Tachiiri discloses a worm wheel gear 65 which teaches the art of composing a wheel gear manufactured with a method that uses a resin material molded integrally with a wheel gear which is formed having a metal core portion (paragraph 38).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the reducer and potentiometer arrangement of Endo; as modified by the side face swirl grooved wheel gear of Fecht potentiometer and manufactured the grooved worm wheel as modified; using a metal core part for fixing the gear wheel about the shaft and molding the gear with a resin outer peripheral surface; as is old and well known in the art for providing a rigid center gear potion with the added benefits of a resin outer surface for a worm wheel and in association with a potentiometer in order to prevent the induction of heat convention; as suggested by Endo for a more accurate reading and where attaching a resin gear

ring integrally on the outer circumference of a rim of a metal worm wheel is commonly used in the gear art to prevent a decrease in the transmission efficiency or to increase the weight, to reduce driving noise and to make lubricant supply unnecessary.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Pantages '584, Rudolph et al '909 and Toyohira JP10191152 disclose a grooved potentiometer on a wheel gear.

Yamamoto et al '151 discloses a resin and metal core worm wheel having a steering angle sensor mounted to the side face of a worm wheel.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Yeagley whose telephone number is (571)272-6655. The examiner can normally be reached on Monday - Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Dickson can be reached on (571) - 272 - 6669. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

D.Y.

/Paul N. Dickson/
Supervisory Patent Examiner, Art Unit 3600